



## Aggregate particle size interrelations and case study in concrete using white ordinary Portland cement [

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text (article)

Analítica

The size distribution, the gradation and the type of aggregates are factors of great relevance for the design of mixtures in concrete and construction materials in general since these allow us to obtain information on the voids contents, module fineness, bulk density, and mechanical performance that certain aggregate mixtures will present. In the present work, different mixtures of aggregates were made using three types of raw materials: fine sand, coarse sand, and 3/8" aggregate, for which their mineralogical composition was evaluated using X-ray diffraction, the chemical composition using X-ray fluorescence, and its macroscopic structure using optical microscopy. Sixty-six mixture formulations were made, to which variables such as fineness modulus, particle size distribution, void content, and density were evaluated. These data were represented in ternary diagrams. From the gradation studies carried out, six formulations were selected based on the type of aggregate used and the content of voids. With this selection, concrete specimens were made, which were subjected to compression tests, finding that the mixture A 22, with 17 % of voids generated a compressive strength of 22 MPa. The results obtained can be used not only in applications such as zero-set concrete, concrete block masonry, or regular concretes, but also in asphalt pavements, ceramic materials obtained by sintering, and particle-reinforced composite materials

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